

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. **Claims 1 and 7** are rejected under 35 U.S.C. 103(a) as being unpatentable over Toshimasa (Japan Patent Application Publication 08-334,478) (hereafter referenced as Toshimasa) in view of Tucker (US 2004/0,003,045) (hereafter referenced as Tucker).

Regarding **claim 1**, Toshimasa discloses Seal Inspection System. Toshimasa specifically discloses A method of photographing an inspected portion of a subject (Figure.1 Sealant Inspection System), comprising the steps of: capturing an image (Take a photograph, paragraph 26), by means of the camera (CCD Camera's, Fig.1), every time the camera's field of view reaches an inspected portion of the subject (inherent in photographing, in order to take a picture of intended subject); and inspecting the condition of the subject (judge abnormality or defect of application, paragraph 5-6), by processing the image data (Application Inspection by Image processing Unit, paragraph 5, Fig.2 Inspection Flow) of the inspected portion that was photographed.

However, Toshimasa fails to disclose arranging a camera that has an automatic focusing function in such a way that it can swivel to a prescribed position facing the subject to be inspected;

Art Unit: 2621

swiveling the camera in such a way that its field of view moves sequentially along an inspected portion of the subject.

In the analogous field of endeavor, Tucker discloses Personal Videoconferencing System Having Distributed Processing Architecture. Tucker specifically discloses arranging a camera (camera, paragraph 21) that has an automatic focusing function (automatic focus, paragraph 21) in such a way that it can swivel (swiveled and tilted, paragraph 21) to a prescribed position facing the subject to be inspected (anticipated by Tucker, because it is the purpose of tilting or swiveling);

swiveling the camera (lens swiveled, paragraph 14) in such a way that its field of view moves sequentially (anticipated by Tucker, because swiveling changes field of view sequentially) along an inspected portion of the subject, in order to properly frame and focus the user's image in focus (paragraph 23).

Therefore, given this teaching, it would have been obvious to one of ordinary skill in the art at the time invention was made to modify Toshimasa by providing arranging a camera that has an automatic focusing function in such a way that it can swivel to a prescribed position facing the subject to be inspected; swiveling the camera in such a way that its field of view moves sequentially along an inspected portion of the subject, in order to properly frame and focus the user's image in focus. The Toshimasa method, incorporating the Tucker automatic focus camera with Swivel and Tilt, has all the features of claim 1.

Regarding **claim 7**, the claimed invention is a device claim corresponding to the method claim 1. Therefore, it is rejected for the same reasons as claim 1.

3. **Claim 2** is rejected under 35 U.S.C. 103(a) as being unpatentable over Toshimasa in view of Tucker, and further in view of Hara (US 6,944,395).

Regarding **claim 2**, Toshimasa and Tucker discloses everything claimed as applied above (see claim 1). However, Toshimasa and Tucker fail to disclose wherein the camera has an automatic exposure adjustment function that automatically adjusts the exposure when an inspected portion of the subject is photographed in color.

However, Hara discloses Image Sensing Apparatus. Hara specifically discloses the camera has an automatic exposure adjustment function (auto exposure function, col. 4, line 12) that automatically adjusts the exposure (Exposure control is performed, col.4, line 9-10) when an inspected portion of the subject is photographed in color (YUV, paragraph 23), in order to attain the proper exposure (col.4, line 8-12).

Therefore, given this teaching, it would have been obvious to one of ordinary skill in the art at the time invention was made to modify Toshimasa and Tucker by providing wherein the camera has an automatic exposure adjustment function that automatically adjusts the exposure when an inspected portion of the subject is photographed in color, in order to attain the proper exposure. The Toshimasa method, incorporating the Tucker automatic focus camera with Swivel and Tilt, further incorporating the Hara automatic exposure, has all the features of claim 2.

Art Unit: 2621

4. **Claims 3 and 8** are rejected under 35 U.S.C. 103(a) as being unpatentable over Toshimasa in view of Tucker, and further in view of Tsikos (US 2002/0,043,561).

Regarding **claim 3**, Toshimasa and Tucker discloses everything claimed as applied above (see claim 1). However, Toshimasa and Tucker fail to disclose wherein the camera has a focal distance change function that adjusts the focal distance of the camera in such a way that every time the camera's field of view reaches an inspected portion of the subject, the resolution of the photographed range is substantially constant.

In the analogous field of endeavor, Tsikos discloses Method of and System for Producing Digital Image of Objects with Substantially Reduced Speckle-Noise Patterns by Illuminating Said Objects Spatially And/or Temporally Coherent-Reduced Planar Laser Illumination. Tsikos specifically discloses wherein the camera has a focal distance change function (variable focal length imaging subsystem, paragraph 446) that adjusts the focal distance (capable of changing its focal distance, paragraph 446) of the camera in such a way that every time the camera's field of view reaches an inspected portion of the subject, the resolution of the photographed range is Substantially constant (the same dpi image resolution, , paragraph 446), in order to have the same image resolution regardless of object position (paragraph 446).

Therefore, given this teaching, it would have been obvious to one of ordinary skill in the art at the time invention was made to modify Toshimasa and Tucker by providing wherein

the camera has a focal distance change function that adjusts the focal distance

of the camera in such a way that every time the camera's field of view reaches an inspected portion of the subject, the resolution of the photographed range is Substantially constant, in order to have the same image resolution regardless of object position. The Toshimasa method, incorporating the Tucker automatic focus camera with Swivel and Tilt, further incorporating the Tsikos variable focal length imaging subsystem, has all the features of claim 3.

Regarding **claim 8**, the claimed invention is a device claim corresponding to the method claim 3. Therefore, it is rejected for the same reasons as claim 3.

5. **Claims 4-5, and 9-10** are rejected under 35 U.S.C. 103(a) as being unpatentable over Toshimasa in view of Tucker, and further in view of Higashi (US 2002/0,024,660).

Regarding **claim 4**, The Toshimasa method, incorporating the Tucker automatic focus camera with Swivel and Tilt, as applied to claim 1, discloses A method of inspecting the state of adhesion of a paste-type member (Toshimasa, Figure.1 Sealant Inspection System), comprising the steps of:

arranging a camera that has an automatic focusing function (Tucker: automatic focus, paragraph 21) in such a way that

it can swivel (swiveled and tilted, paragraph 21) to a prescribed position facing the subject (anticipated by Tucker, because it is the purpose of tilting or swiveling), to the upper surface of an outer edge (anticipated in sealant application) of which a paste-type member adheres in the form of a continuous strip (Toshimasa: 41 at Fig. 4(a)-(c)); swiveling the camera in such a way that its field of view moves sequentially (anticipated

Art Unit: 2621

by Tucker, because swiveling or tilting changes field of view sequentially) along an outer edge of the subject (anticipated by Toshimasa, because the sealant has to be applied along an outer edge of the subject); capturing an image (Toshimasa: Take a photograph, paragraph 26), by means of the camera, every time the camera's field of view reaches an inspected portion (inherent in photographing, in order to take a picture of intended subject) of the paste-type member (sealant includes paste-type member) that adheres in the form of a strip (Toshimasa: 41 at Fig. 4(a)-(c)) to the upper surface of an outer edge of the subject (anticipated in sealant application);

extracting color or shading (Tucker: YUV, paragraph 23) from the captured image;

sequentially detecting the width (Toshimasa: Width of the applied seal material is inspected) of the extracted strip-shaped region of the paste-type member;

judging whether or not the strip-shaped region is of a prescribed width (less than minimum setting length, paragraph 59); and

determining if the state of adhesion of the paste-type member is defective (width error, paragraph 59) by judging whether the width of the detected strip-shaped region is too much wider or too much narrower (less than minimum setting length, paragraph 59) than the prescribed width.

However, Toshimasa fails to teach deleting noise from the image data of the captured image.

In the analogous field of endeavor, Higashi discloses Method for Inspection of Circuit Boards and Apparatus for Inspection of Circuit boards. Higashi specifically discloses deleting noise (noise removing process, paragraph 84) from the image data of the captured image, in order to eliminate regions excluded from ROI (region of interest) (paragraph 84).

Therefore, given this teaching, it would have been obvious to one of ordinary skill in the art at the time invention was made to modify Toshimasa and Tucker by providing deleting noise from the image data of the captured image, in order to eliminate regions excluded from ROI. The Toshimasa method, incorporating the Tucker automatic focus camera with Swivel and Tilt, further incorporating the Higashi noise removal, has all the features of claim 4.

Regarding **claim 5**, The Toshimasa method, incorporating the Tucker automatic focus camera with Swivel and Tilt, further incorporating the Higashi noise removal, discloses everything claimed except *further comprising the step of: displaying on a display device the judgment result of whether the width of the detected strip-shaped region is too much wider or too much narrower than the prescribed width.*

However, Toshimasa discloses sealant width error which was caused by “less than preset value” and displaying the actual length of the image data on the monitors (paragraph 30) and printing the inspection results on the printer (paragraph 31). Therefore, the inspection result can also be displayed on the monitor as well, in order to do display the result in user friendly mode.

Therefore, given this teaching, it would have been obvious to one of ordinary skill in the art at the time invention was made to modify Toshimasa and Tucker and Higashi by providing *displaying on a display device the judgment result of whether the width of the detected strip-shaped region is too much narrower than the prescribed width*, in order to do display the result in user friendly mode. The Toshimasa method, incorporating the Tucker automatic focus camera with Swivel and Tilt, further incorporating the Higashi noise removal, further incorporating displaying inspection result, has all the features of claim 5.

Regarding **claim 9**, the claimed invention is a device claim corresponding to the method claim 4. Therefore, it is rejected for the same reasons as claim 4.

Regarding **claim 10**, the claimed invention is a device claim corresponding to the method claim 5. Therefore, it is rejected for the same reasons as claim 5.

6. **Claim 6** is rejected under 35 U.S.C. 103(a) as being unpatentable over Toshimasa in view of Tucker, further in view of Higashi, and further in view of Fujino (US 2001/0,024,017).

Regarding **claim 6**, The Toshimasa method, incorporating the Tucker automatic focus camera with Swivel and Tilt, further incorporating the Higashi noise removal, as applied to claim 4, discloses everything claimed except *wherein the paste-type member that adheres to the upper surface of an outer edge of the subject in the form of a continuous strip is a liquid gasket*.

Art Unit: 2621

In the analogous field of endeavor, Fujino discloses Metal Gasket. Fujino specifically discloses *wherein the paste-type member that adheres to the upper surface of an outer edge of the subject in the form of a continuous strip is a liquid gasket* (paste-like liquid gasket, paragraph 6), in order to have a good sealing characteristics (paragraph 6).

Therefore, given this teaching, it would have been obvious to one of ordinary skill in the art at the time invention was made to modify Toshimasa and Tucker and Higashi by providing *wherein the paste-type member that adheres to the upper surface of an outer edge of the subject in the form of a continuous strip is a liquid gasket*, in order to have a good sealing characteristics. The Toshimasa method, incorporating the Tucker automatic focus camera with Swivel and Tilt, further incorporating the Higashi noise removal, and further incorporating the Fujino liquid gasket, has all the features of claim

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Bigler (US 2002/0,131,773) discloses System and Method for remote image centering.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hee-Yong Kim whose telephone number is (571)270-3669. The examiner can normally be reached on Monday-Thursday, 8:00am-5pm EST.

Art Unit: 2621

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marsha Banks-Harold can be reached on 571-272-7905. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/HEE-YONG KIM/
Examiner, Art Unit 2621
/Marsha D. Banks-Harold/

Supervisory Patent Examiner, Art Unit 2621

/Andy S. Rao/
Primary Examiner, Art Unit 2621
April 8, 2010